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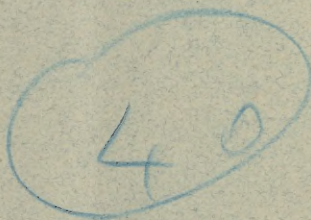
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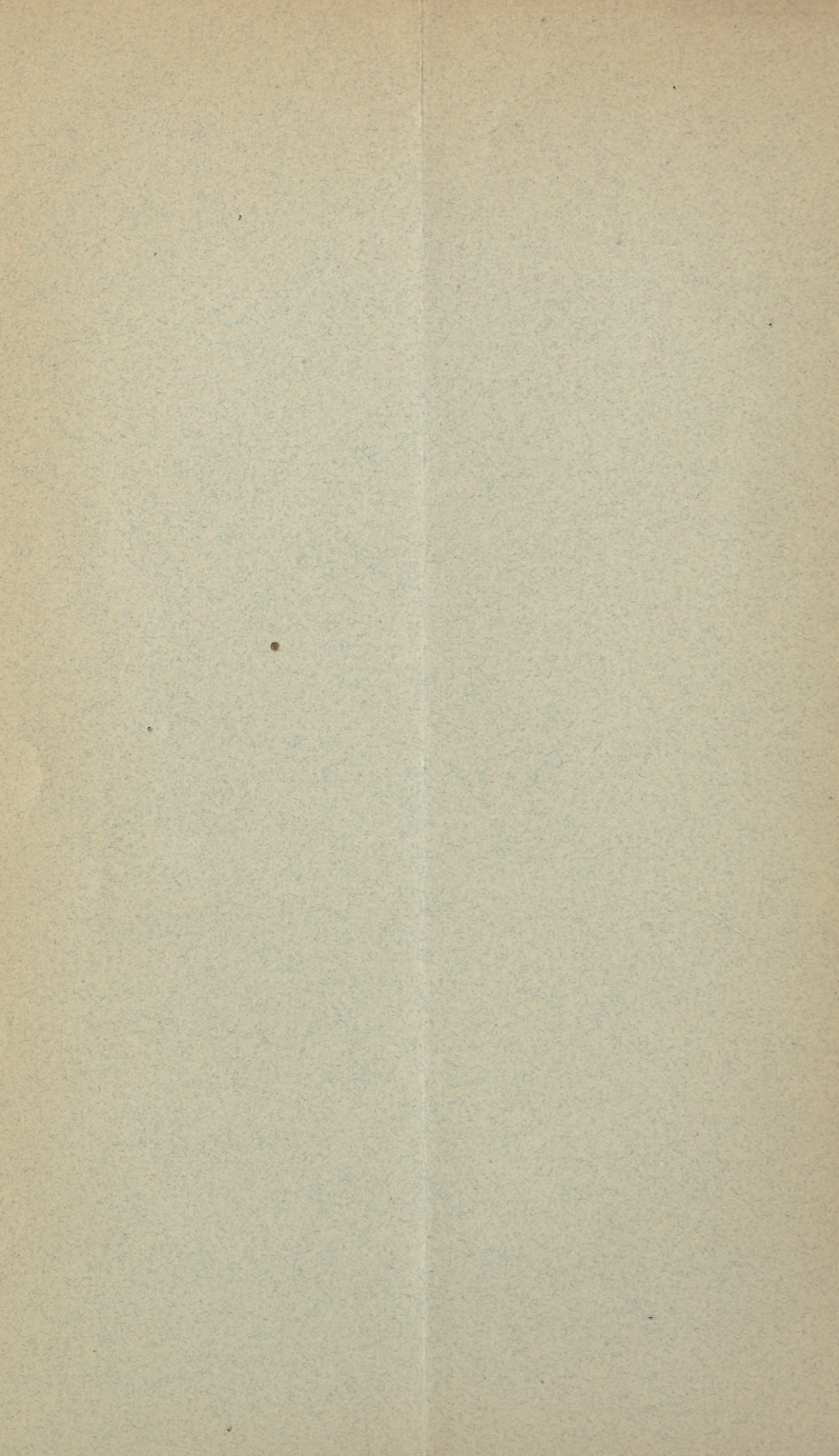
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VAGINAL LITHOTOMY.¹

BY J. COLLINS WARREN, M. D.,

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IN August last I was requested by Dr. Alexander Jackson, of Plymouth, to operate upon a case of calculus in the female bladder. The patient was sixty-seven years of age, and when I saw her for the first and only time, on the day of the operation, was in bed, appearing much emaciated and pale. She had been suffering greatly with symptoms of cystitis for the better part of a year, and although previously healthy had become a confirmed invalid. There were no symptoms of renal complications. She was the mother of several children. The patient, being etherized, was placed in the position for lithotomy in the male, and a lithotrite was introduced into the bladder for the purpose of determining the size of the stone. The examination showed that it was not a small one, and in view of the degree of inflammation of the bladder and her advanced age I decided to remove it by vaginal lithotomy. The operation was thus performed with the assistance of Drs. Stedman and Jackson. A large bulb-pointed probe was passed into the bladder, and its end made prominent beneath the mucous membrane of the anterior wall of the vagina, at a point just behind the neck of the bladder. An incision was made into the bladder at this point, the knife cutting against the end of the probe. A pair of probe-pointed scissors were introduced into the opening thus made, and the incision was enlarged backwards along the median line to the extent of one inch. The stone was extracted by a pair of polypus forceps. The bladder was then washed out with warm water, and the edges of the wound were brought in contact with six silver wire sutures. A female catheter was retained in the bladder and the patient left in charge of Dr. Jackson, from whom I subsequently learned that she at first did well and no urine passed through the wound. Two weeks after the operation there were symptoms of abdominal inflammation, and some leakage occurred through the wound. Two months later the condition of the patient had improved greatly, and under the application of caustic the slight fistula which still remained had closed, but had reopened at the end of forty-eight hours; Dr. Jackson had no doubt, however, that it would

¹ Read before the Massachusetts Medical Society.

eventually close. Under the date of March 28th, Dr. Jackson writes, "Mrs. R. is about, feeling quite well, with the exception of a little cold recently." The stone¹ contained a nucleus, which was about the size of an almond shell, consisting of oxalate of lime, its surface being coarsely crystalline. The cortical portion which was broken into several fragments during the examination, was phosphatic. The weight of the stone was $214\frac{3}{4}$ grs.

Vaginal lithotomy, or vesico-vaginal lithotomy, as it is sometimes called, is no novelty, although the operation has been much more frequently performed since the treatment of vesico-vaginal fistula has been brought to its present degree of perfection. The employment of sutures to close the incision connecting the bladder with the vagina has placed the operation on an altogether different footing. The first operation was performed by Roussel in the latter part of the sixteenth century, in a case of procidentia and cystocele, in the cul-de-sac of which was found a stone. Fabricius Hildanus removed a calculus through a vesico-vaginal fistula, caused by its presence in the bladder, in 1598. The operation was performed in the last century and also in the early part of the present century, and was almost invariably followed by incontinence of urine resulting from fistula. Faure is, however, reported in 1808 as having avoided a fistula by cutting obliquely through the septum and thus making a valvular opening into the bladder. The first case in which sutures were employed to close the incision occurred, so far as I can discover, in the practice of Dr. Marion Sims. A fistula remained, however, which was subsequently closed by Bozeman. This is probably the operation performed by Sims in 1850. Vallet, of Orléans, employed sutures in two cases in 1856. An interesting historical account of the various operations for stone in the female is given by Hybord.² In 1853 Dr. William G. Wheeler,³ of Chelsea, removed a stone weighing two ounces and three quarters, which had formed about a hair-pin three and one half inches in length through an incision in the septum. Sutures were not used, but the remaining fistula was closed many years afterwards by Dr. R. M. Hodges. Lithotomy was tried in this case without success. A case may be mentioned in this connection, occurring in the practice of M. Panas,⁴ who extracted a hair-pin from the bladder by forcing it through the vesico-vaginal septum. The puncture of the septum occurred accidentally during efforts at extraction through the urethra. The pin was drawn into the vagina, straightened, and removed. In four days the patient left the hospital, no trace of the puncture remaining. Dr. R. M. Hodges performed vesico-vag-

¹ Examined by Dr. E. S. Wood.

² Des Calculs de la Vessie chez la Femme et les petites Filles. Paul Hybord. Paris. 1872.

³ American Journal of the Medical Sciences, xxv. 361.

⁴ France médicale, February 26, 1876.

inal lithotomy some sixteen years since, closing the wound by suture with complete success. Dr. Emmett has performed this operation more frequently than any other surgeon, and it is a curious fact that in nearly all of his cases the calculus had formed after an operation for the cure of vesico-vaginal fistula. In nearly every case the cystitis was sufficiently severe to necessitate leaving the opening unclosed after removal of the stone. In some cases measures were taken to prevent closure of the wound, and when this was not done the wound healed invariably within two weeks. Dr. Emmett¹ has treated a number of cases of chronic cystitis in the female by an incision through the vesico-vaginal septum. The wound was kept open by a hollow glass stud, not unlike a spool in shape. He thinks the operation, if resorted to before the disease has advanced so far as to involve the kidneys, is as free from risk as any in minor surgery. He is satisfied that any one who has the dexterity properly to crush a stone by the female urethra can with much less difficulty close the fistulous opening after lithotomy.

This operation has rapidly increased in favor with many English surgeons. Mr. Aveling² was one of the first to call attention to its advantages when followed by suture. He gives a table of thirty-four cases, and adds one operated upon by himself. Twelve of these were performed by English surgeons. In all of them there is but one death recorded. In twelve given by Hybord no death occurred. Aveling believes that although lithotomy ought not to supplant the more simple process of dilatation and crushing, it should be employed when there is the least apprehension of incontinence. James R. Lane, Esq.,³ operated upon a case in which the stone was nearly two inches in length, dividing the septum to within a short distance of the attachment of the vagina to the cervix uteri. The patient recovered eventually without a fistula, although the edges of a small portion of the wound had to be pared and sewed together subsequently. He thinks there is no part of the vesical parietes which may be incised with so little risk, and that this operation is the safest and best which has yet been devised.

This procedure has not been confined to the adult. A number of cases have been reported where it was performed upon young children. Of these may be mentioned one by Dr. Thomas Smith,⁴ the child being but five years of age. The incision was made and the sutures taken without rupturing the hymen. In a second case, in a patient ten years old, he made an incision through the fourchette before cutting through the septum; four sutures were taken in the vaginal wall and three in the perinæum. The patient recovered without incontinence. Dr. S.

¹ Chronic Cystitis in the Female, *American Practitioner*, February, 1872.

² *Obstetrical Transactions*, 1864, v. 1.

³ *Lancet*, January 10, 1863.

⁴ *Lancet*, December 17, 1870.

H. Tewksbury¹ removed a stone the size of a pigeon's egg, through the septum, from the bladder of a girl seven years of age. The vagina was dilated gradually and a small Sims's speculum was introduced, which brought the parts well into view. The sutures were removed on the fourteenth day, when the wound was found united. Dr. Tewksbury's paper contains much valuable information in regard to the history of the operation. He thinks dilatation of the urethra is available in females who have borne children.

The operation has been performed by a number of American surgeons. Indeed, it seems to have been done more frequently in this country than in any other. Through the kindness of Dr. C. H. Mastin, of Mobile, Alabama, I have obtained the following list of surgeons with the number of cases operated on by them : —

J. Marion Sims	1 case.
J. H. Thompson, Washington, D. C.	2 cases.
J. W. Jones, Wilmington, N. C.	1 case.
Jno. T. Hodgen, St. Louis, Mo.	3 cases.
Christopher Johnson, Baltimore	1 case.
Samuel Choppin, New Orleans	1 "
J. M. Keller, Louisville, Ky.	1 "
A. H. Halberstadt, Pottsville, Penn.	2 cases.
Thos. Wood, Ohio	2 "
Thos. A. Emmett, New York	16 "
Paul F. Eve, Nashville	2 "
Charles Bell Gibson, Richmond	1 case.
Greenville Dowell, Galveston	1 "
Ferd. Herff, San Antonio, Texas	1 "
Total	35 cases.

He speaks of six other cases, the names of the operators not being given, making in all forty-one cases.

I have recently obtained the notes of a case performed by Dr. H. O. Marcy, of Cambridge, in April, 1874. The patient since her confinement in February, 1873, had suffered from cystitis. After an attempt at crushing, having first dilated the urethra, and failing through the size and hardness of the calculus, vaginal lithotomy was performed. The incision was made in the median line, commencing about one inch from the urethra, and was continued to include a small portion of the cervix uteri, to allow the extraction of the stone, which weighed over one ounce, and was rough and hard. It was chiefly phosphatic and contained as a nucleus a few fibres of cotton. The wound was brought together with fine silver sutures and united in its entire extent. A minute opening was left, however, at the point of entrance of one wire, which has not closed, although an attempt has since been made to close it.

It will be gathered from the testimony given above that lithotomy is not

¹ Transactions of the Maine Medical Association, 1871.

a difficult operation to perform on the female. This fact appears to have struck forcibly all operators at their first effort, and none more so than myself. The patient being placed in the position for lithotomy, when the labia were separated the anterior wall of the vagina was seen hanging like a curtain at the mouth of the vagina. So superficial was this part that it could be incised and sewed with nearly as much facility as the perinæum. The operation appears to be attended with little or no danger, hardly a single death being reported; on the contrary, in cases where the attending inflammation is severe we find that it not only removes the cause but exerts a curative influence upon the inflammation itself, provided we simply avoid using the suture. The only real danger is from a failure of union of the wound, and this with our present knowledge of the treatment of vesico-vaginal fistula has been reduced to a minimum. Incontinence resulting from this cause is far more easily remedied than that which follows from over-distention and paralysis of the urethra.

A very old method of removing calculi from the female bladder, and one which has been growing greatly in favor of late, is extraction through the dilated urethra. Franco¹ proposed this operation in 1561. Collet combined dilatation with crushing in 1669. This was a favorite method with Sir Astley Cooper, who performed it three times without incontinence resulting. Dr. Yellowly² mentions a number of cases where stones of extraordinary size have passed the urethra. In a case which occurred in his own practice the stone weighed over three ounces. In another case the patient, having suffered greatly and after having experienced "an uncommon weight and forcing" on one occasion, brought away, "with a noise which very much surprised the whole company," a stone seven and a half inches in circumference. In all the cases given by him there was permanent incontinence subsequently. This danger of incontinence appears to have been recognized at an early period. Tolet³ found that if dilatation was excessive, the fibres of the urethra could not contract, and incontinence followed. Brodie⁴ says, "I suspect that there is no method of removing it entire from the female bladder without incontinence of urine to a greater or less extent being a consequence of the operation." Vaginal lithotomy with suture was of course not then known. In three out of ten cases mentioned by Hybord there was incontinence subsequently. Mr. Bryant⁵ reports two cases of calculus removed by rapid dilatation, which was effected by Weiss's dilator, a steel instrument with three branches, used, I believe, originally by Sir Astley Cooper. In his first case the shortest diameter

¹ Franco, *Traité des Hernies*, page 140.

² *Medico-Chirurgical Transactions*, vol. vi., 1815.

³ *Traité de la Lithotomie*. Paris. 1708.

⁴ The works of the late Sir Benjamin Brodie, ii. 649.

⁵ *Medico-Chirurgical Transactions*, vol. xlvii.

of the calculus was one inch, and the age of the patient fifty-two years. In the second case, although the stone was caught in one of its shortest diameters, it measured with the forceps exactly two inches. The patient was thirty-five years old. In both cases was control gained over the bladder for several hours. Mr. Bryant has collected twenty-eight cases, in thirteen of which slow dilatation was employed and in fifteen rapid dilatation. Among the former there were four cases of incontinence; in three of these, however, the stone was very large; among the latter there were none. He much prefers rapid dilatation, and states that "in children calculi one inch in diameter and in adults two inches may be safely removed by these means." Mr. Bryant extracted a lady's stiletto from the bladder, guiding it by the finger introduced through the urethra. No incontinence followed.

Spencer Wells cautions against dilatation. A large stone, he says, may be removed and no incontinence follow, but incontinence might result from the removal of a very small calculus. (In one of Bryant's cases of incontinence the stone was not large.) Incisions into the urethra he thinks more dangerous still, and mentions cases in the practice of a surgeon of large experience where it had been done in two adults and seven children, but "they were all dribblers." He prefers lithotomy. Lane is decidedly of the opinion that dilatation of the urethra should be employed only in the removal of stones of small size, the risk of incontinence being great and the result incurable. 'The facility of dilatation renders it highly tempting to the surgeon, while the safety and bloodlessness commend it strongly to the patient. The consequence is that it has caused many an unfortunate woman to pass the rest of her days in a loathsome and miserable condition. No stone, he thinks, larger than an acorn should be removed in this way from the adult and none larger than a horse-bean from a child. He condemns strongly all incisions into the urethra.

When a stone is suspected, Christopher Heath¹ does not hesitate to explore the bladder with the forefinger, previously introducing the little finger or dilating with the dressing forceps. He finds in all cases that have undergone this manipulation a split in the mucous membrane under the pubes and some incontinence for twenty-four hours. After this the patient ordinarily recovers complete control over the bladder. In one case a stone three fourths of an inch in diameter was removed from a child, aged eleven years, through the urethra, and subsequently a fragment of a second stone weighing four hundred and eight grains. Incontinence in this case was permanent. For such a case he would recommend vaginal lithotomy. He cautions against the mistake of making the incision too small, the edges of the wound being bruised by a stone too large to pass through easily. He thinks there is no danger

¹ Medical Times and Gazette, April 11, 1874.

of wounding the peritoneum, even if the incision be carried up to the os uteri. In taking sutures both the vaginal and vesical walls should be included. He has operated three times: in two cases the wound healed by first intention; in the third there was a slight fistula. In one of the successful cases the calculus weighed three and one half ounces. The ages of the patients were forty-nine, forty, and fifty years respectively.¹

During the past year medical writers have had a great deal to say about the treatment of cystitis by dilatation of the urethra. Dr. T. W. Howe² reported a case of cystitis cured in this way. This article has brought out a series of communications by Dr. Pridgin Teale, in the *Lancet*,³ which are not yet concluded. He and several of his colleagues have employed this treatment for some time past with satisfactory results. This method consists in slowly dilating the urethra by a Weiss's dilator until the fingers can be introduced into the bladder. It is noticeable that in three instances death occurred within a short time after the operation; there was in these cases, however, disease of the kidneys. Two cases suffered from incontinence afterward, and Mr. Teale makes the significant remark, "It does not, however, appear that the liability to permanent incontinence depended upon the degree to which the dilatation was carried." Hewetson⁴ and Heath⁵ have both written upon the subject. Dr. George Jewett⁶ removed a crocheted-needle by introducing the index finger into the bladder through the urethra. He noticed a slight rupture at the meatus during his manipulations, but there was no incontinence. The most accurate measurements which have been taken to determine precisely how much the urethra may be dilated without running the risk of incontinence are those made by Professor Simon, of Heidelberg, and published in Volkmann's *Sammlung klinischer Vorträge*,⁷ in July last. He recommends smooth, hard rubber plugs of different sizes, by which, when combined with incisions of the orifice of the canal, dilatation may be accomplished without rough handling of the urethra. This limit is two centimetres or .8 inch in width, and 6.3 centimetres or 2.4 inches in circumference. Dilatation to this size permits the index fingers of most surgeons to be passed with ease into the bladder. Simon's finger is small enough to enable him to pass at the same time a very slender instrument. A pair of polypus forceps, such as Mr. Heath uses, would, if introduced at the same time with the finger, as he recommends, stretch beyond this limit. A stone must obviously be a small one to

¹ Transactions of the Pathological Society, vol. xxvi.

² New York Medical Record, August 14, 1875.

³ *Lancet*, November 27, 1875. Dr. T. B. Curtis, the *Journal*, December 30, 1875.

⁴ *Lancet*, December 4, 1875.

⁵ *Lancet*, December 11, 1875.

⁶ The *Journal*, January 27, 1876.

⁷ Translated in the New York Medical Journal, October, 1875.

be removed by an instrument delicate enough to pass so narrow a space. Hybord puts the limit of dilatation as high as three to four centimetres. Dr. W. W. Lawrence reports in the *Louisville Medical News* a case of stone in a girl five years of age. The urethra was dilated with the fingers, and crushing was combined with extraction. It is not stated whether there was any subsequent incontinence. Dr. D. W. Yandell reports in the same journal a case of bilateral urethral lithotomy in a girl eleven years old. The stone was crushed before removal, and weighed two ounces. There was perfect recovery. In a second case, a girl four years of age, the urethra was divided on a director a short distance behind the meatus, for the extraction of a uric acid calculus the size of a filbert. Incontinence is not mentioned. Dr. Herrgott, in an article in the *Annales de Gynécologie*, January, 1876, gives three cases in which dilatation was practiced for removal of growths from the bladder. An instrument was introduced with the finger, and the operation continued in each case upwards of one hour. The limit given by Simon was not exceeded, and no incontinence followed. In one case the author contemplates removing a remaining portion of the growth through an incision in the vesico-vaginal septum. He mentions several cases where coitus was performed through the urethra. Mention of this fact has also been made by other authors. Incontinence of urine was not present in these cases. Notwithstanding that many successful cases of dilatation with or without crushing have been reported, a high authority in this country expresses himself strongly against this operation. Dr. Emmett, in his work on vesico-vaginal fistula, says, "Comparatively, I do not regard the removal of stone in the female by the urethra as either a safe or a justifiable operation, in consequence of the great risk of incontinence of urine which frequently remains permanent. I have seen at least seven cases in support of this assertion for which no relief could be afforded, and in which I am satisfied that the accident had not resulted from want of skill on the part of the operator."

An interesting clinical lecture by Dr. Hunter McGuire¹ gives the history of a case of vaginal lithotomy in a negress forty years of age. The stone was two and a half inches in diameter. Ten wire sutures were taken and removed on the eighth day, a catheter being retained a few days longer for safe union. Dr. McGuire states that many cases of so-called successful operations by dilatation and extraction have, to his personal knowledge, been followed by incontinence, the term "successful" referring to the extraction of the stone. He says, "We all know how easily a surgeon can introduce his finger into the female bladder when the woman is under the influence of chloroform," "but it certainly is not always safe to do this." In a case at present under his care, a lady

¹ West Virginia Medical Student, May, 1876.

twenty-four years of age had been suffering with chronic cystitis, which resisted the usual remedies, and the physician had introduced his finger through the urethra to explore the bladder. Complete incontinence of urine followed. On examination he found the meatus contracted to probably its original size, but the vesical end of the urethra and mouth of the bladder loose and relaxed, with all sphincter power destroyed. He proposes to make a vesico-urethra-vaginal fistula by removing an elliptical-shaped piece of the septum, and to close it by silver wire sutures in the ordinary manner. He does not believe it is ever necessary to introduce the finger into the female bladder for the sake of diagnosis. A stone over half an inch in diameter should not be removed per urethram. He condemns urethral lithotomy as leading almost invariably to incontinence. Lithotrixy, he thinks, is more difficult than in the male. The absence of the prostate gland and of the smooth fixed trigone which we find in the male bladder, the slight prolapse of the posterior wall found in almost all women who have borne children, the sometimes sacculated or perhaps displaced bladder, are some of the more important explanations of this difficulty. Byford is opposed to lithotrixy for similar reasons. Dr. Savory, of Lowell, informs me that he has had a case of incurable incontinence following dilatation for the removal of a stone of small size.

Sponge tents have been employed to dilate the urethra for the purpose of removing calculi. They may be useful when the patient dreads anaesthesia, or when the stone is so small as to be voided spontaneously by the bladder on removal of the sponge. This occurred in a case in the practice of Dr. George H. Bixby, of this city, where eleven small calculi came away upon the removal of a sea tangle tent. Dr. D. H. Storer has lately removed a calculus in this way without incontinence subsequently.

Dr. Buchanan,¹ of Glasgow, has performed the operation known as lateral lithotomy on a girl six years old. The operation resembles closely that performed on the male. A rectangular staff being introduced and held under the arch of the pubes, an incision is made into the left nympha, care being taken to avoid opening the vagina on the one hand and cutting too near the tuber ischii on the other. The left forefinger, introduced into the wound, feels with its nail the staff, and the knife guided along the nail is passed through the neck into the bladder. In his case there was some difficulty in retaining the urine at the last account. Dr. Morton operated in this way on six cases, with what is stated to be a favorable result. Mr. Lane believes it to be an excellent operation, and admirably adapted for children. Dr. David Foulis² made a dissection of the bladder of a woman on whom this operation had been

¹ *Medical Times and Gazette*, May 3, 1862.

² *British Medical Journal*, No. 786, page 115.

performed twenty years before, and who died of renal dropsy. A conical opening was found in the left labium minus from which ran a canal opening into the urethra and also into the vagina. The patient had been able to retain her urine, however.

In examining the records of the Massachusetts General Hospital I find from 1821 to 1868 seventy-nine cases of stone reported, of which nine were in females. From 1821 to 1871, a period of fifty years, there were but ten cases of stone in the female. Of these calculi two were extracted through vesico-vaginal fistulae, one being removed entire, the other being crushed previous to extraction. Five were treated by lithotrity, and in three cases the stone was extracted through the dilated urethra. Of the latter, one was a stone weighing two hundred and eighty grains; the urethra being dilated, it was seized by a pair of forceps and attempts were made to crush it, but without success. It was finally extracted through the urethra. Death occurred two days later, and at the autopsy the urethra was found considerably dilated, and in that portion below and a little to the right of the arch of the pubes was an irregular laceration more than one inch in length, extending into the bladder. It had the appearance of being due to sloughing of the part. The ureters were dilated and the kidneys diseased. In the two cases the urethra was found considerably dilated before the operation. In one a stone three fourths of an inch in diameter was extracted and no incontinence followed. In one case three calculi were extracted, one being the size of a large peach-stone. There was a small fistula in this case, which was subsequently operated upon. The records of many patients operated upon during this period are not to be obtained, they having been treated as out-patients. Dr. C. B. Porter has recently removed a calculus from the female bladder through the dilated urethra. The calculus was partially crushed previous to extraction. Dilatation was not carried beyond Simon's limit. There was no incontinence.

There are several methods of treating stone in the female which have not been discussed in this paper. Lithotrity, for instance, has been scarcely alluded to. My object has been to contrast the operation of vaginal lithotomy with one which has been employed in a class of cases to which that operation is mainly suited, and to discuss the comparative merits of two methods of operating which are now coming into fashion.

Lithotrity is undoubtedly as simple and harmless an operation as any, in the hands of a skillful surgeon, provided its use is limited to a certain range of cases. It was attempted, as has been seen, in several cases where extraction of the stone was subsequently resorted to. I recall one case where this treatment was carried through a long series of sittings. The patient was cured of her stone, which was a very large one, but died, a few months later, of exhaustion. Vaginal lithotomy might have saved her. Large stones have been crushed and removed at one

sitting, in both males and females. The alternative in the male is a capital operation ; in the female, on the other hand, one which has been placed within the domain of minor surgery. We are not, therefore, authorized in females, as we are in males, to take any great risk. I think we may safely say, therefore, that lithotrity should be confined to cases where the stone is neither large nor hard. Dilatation of the urethra combined with lithotrity would enable us, however, to remove a much larger stone at one operation than by lithotrity alone. The dilatation must be done rapidly but gently, and certainly must not exceed the limit given by Simon. (I do not think it is fully proved that we may not have incontinence following dilatation even within this limit, although such an occurrence is not likely.) If the stone be hard, but small enough, it may be extracted whole through the dilated urethra. If, on the other hand, the stone is large and there is much cystitis, or the patient is feeble, or we have reason to suspect trouble in the kidneys, vaginal lithotomy should be the operation. We should be on the safe side in giving this operation the benefit of the doubt when there is any question of choice. The age of the patient is not a contra-indication to the operation, although I believe that it is rarely necessary to perform it upon children, who bear lithotrity well. Vaginal lithotomy, it is hardly necessary to point out, is far preferable to the supra-pubic operation.

In conclusion, we may say that vaginal lithotomy, involving at the worst a danger completely within our control, may be employed in a much wider range of cases than it has been hitherto ; while dilatation of the urethra, entailing, it may be, an infliction which it is beyond our power to remedy, should be practiced with great caution, until we more fully understand the class of cases to which it is suited and have determined with greater certainty the limit to which it can be carried.

